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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/133,989 08/14/98 DOAN

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EXAMINER

IM52/0228

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ART UNIT

PAPER NUMBER

1734

DATE MAILED:

02/28/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

Office Action Summary

Application No.

09/133989

Applicant(s)

Doan

Examiner

L. Edwards

Group Art Unit

1734

—The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address—

Priority Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).

Status

- ☒ Responsive to communication(s) filed on 2-14-00
- ☐ This action is FINAL.
- ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

Disposition of Claims

- ☒ Claim(s) 12-33 is/are pending in the application.
- Of the above claim(s) _____ is/are withdrawn from consideration.
- ☐ Claim(s) _____ is/are allowed.
- ☒ Claim(s) 12-33 is/are rejected.
- ☐ Claim(s) _____ is/are objected to.
- ☐ Claim(s) _____ are subject to restriction or election requirement.

Application Papers

- ☐ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.
- ☐ The proposed drawing correction, filed on _____ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on _____ is/are objected to by the Examiner.
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. § 119 (a)-(d)

- ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).
- ☐ All ☐ Some* ☐ None of the CERTIFIED copies of the priority documents have been received.
- ☐ received in Application No. (Series Code/Serial Number) _____.
- ☐ received in this national stage application from the International Bureau (PCT Rule 1.7.2(a)).

*Certified copies not received: _____.

Attachment(s)

- ☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 10
- ☒ Interview Summary, PTO-413
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Other _____

Office Action Summary

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Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claim 20 is rejected under 35 U.S.C. 102(b) as being anticipated by Uchida et al (JP 56-73579).

Uchida et al teach a negative pressure device (5) defining a vacuum area intersecting the wafer while the device is in a operational position (i.e., the wafer being moved as shown by the arrow in Fig. 3), and a solvent dispenser (4) intersecting the vacuum area and aligned with a edge of the wafer while the device is in operational position.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 12-14 and 17-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Honda (JP 8-5825) in view of Matsumura (JP 5-175117) or Isono (JP2-157763).

Honda teaches an apparatus to remove coating built-up from the edge of a substrate having a resist coating thereon, the apparatus comprising at least one dispenser (12) for dispensing a permeating fluid onto the edge of the substrate and means (10, 11) including a housing connected to a vacuum source surrounding the at least one dispenser for vacuuming excess fluid from the edge of the substrate to the edge bead or built-up coating (See Figs. 1-3). Even though Honda is silent concerning dispensing a solvent of the material coated on the substrate, it was known in the art at the time the invention was made, to remove the edge bead of a resist coated substrate with a solvent as evidenced by either Matsumura (see abstract) or Isono (see abstract). Therefore, it would have been obvious to one of ordinary skill in the art to use a solvent as taught by either Matsumura or Isono, in the Honda apparatus as an alternate method for removing the edge bead instead of using the developing solution.

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With respect to claim 14, the end of the housing aligns with the edge of the substrate.

With respect to claim 17, the housing defining a vacuum chamber envelops the nozzle and is offset from the edge bead.

Claims 14-19 and 21-33 are rejected under 35 U.S.C. 103(a) as being unpatentable over Uchida et al (JP 56-73579) in view of Honda (JP 8-5825).

Uchida et al teach an apparatus for removing coating from the edge of a coated substrate comprising means (4) for dispensing a fluid (i.e., a solvent such as water) onto the edge of the substrate and means (5) surrounding the dispensing means for vacuuming fluid from the edge of the substrate (See Figs. 1-3). Uchida et al show in Fig. 3, the tip of the apparatus contacting the edge bead but also refers to a gap of 180μ between suction port (2) tip and the substance to be coated (see the example on the last page of the translation). Uchida et al do not show the apparatus being configured to be spaced above the edge bead. However, it was known in the art, at the time the invention was made, to configure an edge bead removal apparatus including a solvent dispenser and vacuum mechanism, out of contact with the wafer or edge bead thereon as evidenced by Honda (See Fig. 3). In view of conventional edge bead removal apparatus as taught by Honda, it would have been obvious to one of ordinary skill in the art to space the Uchida et al edge bead removal apparatus out of contact with the substrate and the edge bead thereon. Moreover, it would have been obvious to one of ordinary skill in the art to place the Uchida et al apparatus at a desired distance from the substrate in order to prevent excessive wear

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and tear to the tip of the apparatus, to prevent excess cleaning of the tip of the apparatus, and to prevent damage to the surface of the substrate. Furthermore, it is deemed to be within the level of ordinary skill in the art to position the Uchida et al apparatus an appropriate distance from the surface of the substrate to remove a desired layer or layers of coating material from the edge of the substrate.

With respect to claim 17, the Uchida et al apparatus provides a solvent dispensing nozzle and a vacuum mechanism enveloping the nozzle. While Uchida et al recognize the apparatus being placed on the edge of the wafer, Uchida et al do not disclose the vacuum mechanism being offset from an edge bead. However, it was known in the art at the time the invention was made to provide in an edge bead removal apparatus a vacuum mechanism offset from the edge bead as evidenced by Honda (See Fig. 3). Honda recognizes placing a housing connected to a vacuum with the housing enveloping the nozzle whereby the housing edge opposite the vacuum supply is placed offset from the edge of the wafer. It would have been obvious to one of ordinary skill in the art to provide the vacuum mechanism in the Uchida et al apparatus offset from the edge of the wafer in order to provide uniformity in suction about the edge of the wafer beyond the location of the edge bead.

With respect to claim 19, Uchida et al fail to teach or suggest the vacuum means enveloping the edge of the substrate. However, it was known in the art at the time the invention was made, to provide a vacuum mechanism enveloping a dispensing nozzle as well as the edge of a coated substrate in order to facilitate the removal of coating build-up on the edge of a substrate

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from its top and bottom surface as evidenced by Honda (see Figs. 2 and 3). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Uchida et al apparatus to envelop the dispensing nozzle as well as the edge of the substrate with a vacuum mechanism as taught by Honda in order to optimize the removal of coating build-up from upper and lower surface of substrate.

With respect to claims 21, 24, 28, and 29, motivation for placement of the negative pressure device and/or the solvent dispenser out of contact with edge bead on wafer surface is *set* forth above.

With respect to claim 22, Uchida et al teach an apparatus including a coaxial dispenser and suction device provided on the top surface of the coated substrate. Uchida et al are silent concerning providing such an apparatus on the top and bottom of the substrate and further having the suction device encompass both the top and bottom dispensers. However, it was known in the art at the time the invention was made to provide top and bottom dispensers with an encompassing suction device disposed about the dispensers in order to facilitate removal from the top and even the bottom of the coated substrate as evidenced by Honda (See Fig. 3). Therefore, it would have been obvious to one of ordinary skill in the art to modify the Uchida et al apparatus to provide top and bottom dispensers and encompass both dispensers with the suction device in order to completely remove any coating material build-up from the top surface as well any material that reaches the bottom surface of the substrate.

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Response to Arguments

Applicant's arguments filed 12/14/00 have been fully considered but they are not persuasive.

Applicant contends that the combination of the teachings of Uchida et al with Honda is improper because Uchida et al and Honda having contradictory teachings whereby Uchida et al teach an apparatus which touches the coating and Honda teaches an apparatus which does not touch the coating. This argument is not deemed persuasive because the combination of the two is proper as both teach a combined suction and dispensing apparatus to remove coating build-up from the edge of a coated substrate. Even though Uchida et al show positioning of the apparatus in the coating material, one of ordinary skill in the art would recognize that such placement of the tip of the apparatus in the coating material would result in more wear and tear, the constant need for cleaning, and the possibility of damage to the substrate. Honda represents the conventional edge bead removal apparatus which is positioned above the edge bead. Moreover, one of ordinary skill in the art would have found it obvious to position the Uchida et al apparatus an appropriate distance from the surface of the substrate to remove a desired layer or layers of coating material from the edge of the substrate.

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Conclusion


Applicant's proposed amendment faxed on 2/22/01 in response to the telephonic interview on 2/20/01 was insufficient to overcome the prior art of record. Therefore, an office has been rendered.

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The following patent discloses the state of the art with respect to a conventional edge bead removal apparatus: Konishi et al (US 5,608,943).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to L. Edwards whose telephone number is (703) 308-4252. The examiner can normally be reached on Monday-Thursday from 8:30AM-6:00PM. The examiner can also be reached on alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino, can be reached at (703) 308-3853. The fax phone number for Art Unit 1734 is (703) 305-7115.

Any inquiry of a general nature such as status inquiries should be directed to the Group receptionist whose telephone number is (703) 308-0661.


LAURA EDWARDS
PRIMARY EXAMINER

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February 23, 2001